

REMARKS

Claims 14-29 are pending in the present application. Claims 1 and 27-29 have been amended to point out that the direct reduction step and the oxidizing smelting step take place in two separate reactors. This amendment is supported by the as-filed specification in at least ¶¶ [0019] and [0021]. In addition, claim 24 has been amended to remove any potential indefiniteness issues. Applicants submit that no new matter has been added to the application. Applicants respectfully request reexamination of the application and reconsideration of the rejections in view of the above amendments and the following remarks, which follow the order set forth in the Office Action.

Rejections under 35 U.S.C. § 112

Claims 24 and 25 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because allegedly there is no antecedent basis for the phrase “the Ge fraction in the first fumes” in line 3. Applicants respectfully traverse. Applicants have amended claim 24 to state “a Ge fraction in the first fumes” in line 3. Applicants submit that claim 24 as amended is not indefinite. Accordingly, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

Rejections under 35 U.S.C. §102

Claims 14, 17, 20, 21, 23, 26, 27, and 29 have been rejected under 35 U.S.C. §102 as being anticipated by Baldock et al., U.S. Patent No. 5,282,881 (“Baldock”). Applicants respectfully traverse.

Amended claim 14 recites a process for valorizing metal values in a Zn-, Fe- and Pb-bearing residue. The process comprises subjecting the residue to a direct reduction step in a first reactor, thereby producing a metallic Fe-bearing phase and Zn- and Pb-bearing first fumes. The Zn- and Pb-bearing first fumes are extracted to recover the Zn and Pb. The metallic Fe-bearing phase is subjected to an oxidizing smelting step in a second reactor thus producing an Fe-bearing slag and second metals-bearing fumes. The second metals-bearing fumes are extracted to recover metals contained therein.

Baldock discloses a single-stage process for smelting waste material to produce metal bearing fumes and an environmentally-suitable slag. See, c. 2, ll. 28-31. In Baldock, waste material and reductant are fed to a smelting furnace and subjected to a single stage smelting operation by submerged injection of fuel and an oxygen containing gas. See, c. 3, ll. 15-20. Baldock discloses that "the key to [smelting in a single stage process] is the need to operate under submerged combustion conditions in such a way that there is established in the melt at least one combustion region at which oxidation occurs, whilst reducing conditions prevail in the melt so as to provide strongly reducing conditions at least at the surface of the melt." C. 2, ll. 41-47. In contrast, amended claim 14 recites that the direct reduction step takes place in a first reactor and the oxidizing smelting step takes place in a second reactor. Baldock fails to disclose a process wherein the direct reduction step and the oxidizing smelting step take place in two different reactors, as recited in amended claim 14. Because Baldock fails to disclose, either expressly or inherently, every limitation of amended claim 14, Applicants submit that Baldock does not anticipate amended claim 14. Accordingly, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

Rejections under 35 U.S.C. §103

Claims 15, 16, 18, and 19 have been rejected for obviousness under 35 U.S.C. §103 as being unpatentable over Baldock. Applicants respectfully traverse.

As indicated above, Baldock discloses a single-stage process for smelting waste material to produce metal bearing fumes and an environmentally-suitable slag. The entire disclosure of Baldock is directed to enabling a single-stage process and explaining the advantages of a single-stage process, particularly the advantages of a single-stage process over a process with two furnaces. See, c. 4, l. 49 - c. 5, l. 7. In addition, Baldock discloses recovery of iron in a matte or spieß or in a separate metal phase. See, c. 3, ll. 25-29 and c. 4, ll. 39-44. In contrast, as recited in amended claim 14, iron is not recovered for valorization but rather is obtained in iron-bearing slag. Baldock further discloses that the injection of fuel and oxygen containing gas produces circulation of the melt in the furnace such that the matte or speiss circulates to, and is oxidized in the combustion region to cause volatilization of the toxic element. See, c. 3, ll. 29-33. As such, there is no selection or direction of particular materials or streams for oxidation, rather, any portion of the melt that happens to end up in the combustion region may be subjected

to oxidation. In contrast, as recited in amended claim 14, Zn- and Pb-bearing first fumes are selectively extracted before the oxidation step, thus only the metallic Fe-bearing phase is subjected to the oxidizing smelting step.

Based on the foregoing, Applicants assert that one of ordinary skill in the art would have no reason to modify the single-stage process of Baldock to transform it to a process wherein separate reactors are used for the direct reduction step and the oxidizing smelting step as recited in amended claim 14. To do so would be in complete opposition to the disclosure of Baldock. As such, Applicants submit that Baldock fails to teach or reasonably suggest every limitation of amended claim 14. Therefore, amended claim 14 and claims 15, 16, 18, and 19, which depend therefrom, are not obvious in view of Baldock. Accordingly, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

In addition, claim 22 has been rejected for obviousness over Baldock in view of Dvorak et al., U.S. Patent No. 3,721,547 ("Dvorak"). Applicants respectfully traverse. Applicants submit that even if Dvorak teaches everything that the Office Action states, such teaching is not enough to overcome the deficiencies of Baldock set forth above because Dvorak is also limited to a single reactor, specifically a cupola. As such, claim 22 is not obvious in view of Baldock in combination with Dvorak. Accordingly, Applicants respectfully request reconsideration and withdrawal of the instant rejection.

Conclusion

For the foregoing reasons, claims 14-29 are considered to be allowable. A Notice to this effect is respectfully requested. If any questions remain, the Examiner is invited to contact the undersigned at the number given below.

Respectfully submitted,

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